

09/872,091

**Drawings**

Please see the replacement sheets for FIG. 1.

**REMARKS**

Applicants wish to thank the Examiner for the attention accorded to the instant application.

Applicants are providing, along with the instant response, replacement sheet for FIG. 1. Claims 11-19 are pending in the application. Applicants have amended claims 11-13 and 16.

**I. Drawings Objections**

The Examiner has objected to FIG. 1. Applicant is providing replacement sheet for FIG.

1. The replacement sheet provided herein does not introduce any new matter. Applicant respectfully requests that the Examiner acknowledge the drawings as addressing the objections to the drawings.

**II. Abstract Objections**

The Examiner has objected to the Abstract. In particular, the Examiner asserts that the Abstract contains informalities.

Applicants have amended the Abstract, particularly with respect to the changes noted by the Examiner in lines 8-9 and lines 10-12. With respect to the Examiner's objections regarding other changes, Applicants respectfully submit that the details of the method of the present invention are clearly stated in the Background of the Invention, and the Summary of the Invention. For instance, the Examiner states that the specification does not state how optimization is done with respect to the response of the bus traffic. Applicants respectfully point to Specification, page 4, lines 2-13 where an evaluation function of the present invention

constantly is updated (via a feedback loop) to optimize the isolation between the hardware and software design.

It is well settled that an “inventor need not, however, explain every detail since he is speaking to those skilled in the art.” In re Howarth, 654 F.2d 103, 105 (CCPA 1981).

Additionally, “not every last detail is to be described, else patent specifications would turn into production specifications, which they were never intended to be.” In re Gay, 309 F.2d 769, 774 (CCPA 1962). Applicants respectfully request withdrawal of the objections.

### **III. Specification Objections**

The Examiner has objected to the Specification for various informalities. Applicants address these objections in turn. No new matter is being added.

¶1. See amendment to the Specification.

¶2. Applicants respectfully submit that the reason for the troublesome nature of conventional LSI simulation is because the verification tools were designed for external connections between a plurality of LSI devices. The trend is now towards producing internal signals within one LSI device. (See e.g., Specification page 1, lines 15-23).

¶3. See amendment to the Specification.

¶4. See amendment to the Specification.

¶5. See amendment to the Specification.

¶6. See amendment to the Specification.

¶7. See amendment to the Specification.

¶8. See amendment to the Specification.

¶9. See amendment to the Specification.

¶10. See amendment to the specification.

¶11. See amendment to the specification.

¶12. Applicants respectfully submit that the optimization occurs with respect to at least equation (1) and equation (2) in the specification (see Specification pages 9 and 14). Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

¶13. See amendment to the specification.

¶14. See amendment to the specification.

¶15. See amendment to the specification.

¶16. See amendment to the specification.

¶17. See amendment to the specification.

¶18. See amendment to the specification.

¶19. See amendment to the specification.

¶20. See amendment to the specification.

¶21. See amendment to the specification.

¶22. See amendment to the specification.

¶23. See amendment to the specification.

¶24. See amendment to the specification.

¶25. See amendment to the specification.

¶26. See amendment to the specification.

¶27. See amendment to the specification.

By the foregoing amendments to the specification, Applicants respectfully submit that the objections to the specification have been addressed, and the rejections should be withdrawn.

**IV. Claim Rejections – 35 U.S.C. §112**

The Examiner has rejected claims 11-19 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention.

¶7.1 Applicants respectfully traverse with respect to claim 11. Applicants respectfully submit that isolation of hardware and software elements is properly described in the specification (see e.g., page 2, lines 5-7). Additionally, the isolation of the hardware and software elements is performed by experimentation since this is an iterative process during the architectural design of the LSI device. Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

¶7.2 Applicants respectfully traverse the new matter rejection with respect to claim 11. Support for the limitation can be found, for example, in the specification page 9, lines 19-21. Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

¶7.3 Applicants have amended claim 11 to more particularly point out and distinctly claim the subject matter regarded as the invention. Applicants respectfully submit that amended claim 11 addresses the Examiner's rejection and request withdrawal of the rejection.

¶7.4 Applicants have amended claim 12 to more particularly point out and distinctly claim the subject matter regarded as the invention. Applicants respectfully submit that amended claim 12 addresses the Examiner's rejection and request withdrawal of the rejection.

¶7.5 Applicants have amended claim 12 to more particularly point out and distinctly claim the subject matter regarded as the invention. Applicants respectfully submit that amended claim 12 addresses the Examiner's rejection and request withdrawal of the rejection.

¶7.6 Applicants have amended claim 13 to more particularly point out and distinctly claim the subject matter regarded as the invention. Applicants respectfully submit that amended claim 13 addresses the Examiner's rejection and request withdrawal of the rejection.

¶7.7 Applicants respectfully traverse the new matter rejection with respect to claim 14. Support for the limitation can be found, for example, in the specification page 10, lines 11-15. Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

¶7.8 Applicants respectfully traverse with respect to claim 15. Applicants respectfully submit that isolation of hardware and software elements is properly described in the specification (see e.g., page 2, lines 5-7). Additionally, the isolation of the hardware and software elements is performed by experimentation since this is an iterative process during the architectural design of the LSI device. Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

¶7.9 Applicants respectfully traverse with respect to claim 16. Applicants respectfully submit that isolation of hardware and software elements is properly described in the specification (see e.g., page 2, lines 5-7). Additionally, the isolation of the hardware and software elements is performed by experimentation since this is an iterative process during the architectural design of the LSI device. Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

It is well settled that an “inventor need not, however, explain every detail since he is speaking to those skilled in the art.” In re Howarth, 654 F.2d 103, 105 (CCPA 1981). Additionally, “not every last detail is to be described, else patent specifications would turn into production specifications, which they were never intended to be.” In re Gay, 309 F.2d 769, 774 (CCPA 1962). Applicants respectfully request withdrawal of the rejections.

¶8.1 The Examiner has additionally rejected claim 15 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not sufficiently described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention.

Applicants respectfully traverse. Applicants respectfully submit that isolation of hardware and software elements is properly described in the specification (see e.g., page 2, lines 5-7). Additionally, the isolation of the hardware and software elements is performed by experimentation since this is an iterative process during the architectural design of the LSI device. Applicants respectfully submit that the optimization will vary with respect to the aims of each hardware/software architecture designer according to varied design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

It is well settled that an “inventor need not, however, explain every detail since he is speaking to those skilled in the art.” In re Howarth, 654 F.2d 103, 105 (CCPA 1981). Additionally, “not every last detail is to be described, else patent specifications would turn into production specifications, which they were never intended to be.” In re Gay, 309 F.2d 769, 774 (CCPA 1962). Applicants respectfully request withdrawal of the rejection of claim 15.

¶10 The Examiner has rejected claim 16 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention.

Applicants have amended claim 16 to more particularly point out and distinctly claim the subject matter regarded as the invention. Applicants respectfully submit that amended claim 16 addresses the Examiner’s rejection and request withdrawal of the rejection.



**V. Claim Rejections – 35 U.S.C. §102**

The Examiner has rejected claims 11-15 and 17-19 under 35 U.S.C. §102(b) as being anticipated by Tammemaie et al. (“AKKA: a Tool-Kit for Cosynthesis and Prototyping”).

Applicants respectfully traverse. The present invention, as recited in amended independent claim 11, is directed to software used to model and to evaluate the performance of hardware and software that is used to design an LSI device. As a result, in the simulation and evaluation phase, software units represent both software design elements and hardware design elements. The performance of this simulation program is then evaluated using an evaluation function that counts traffic using a software unit of the simulation program called a “bus” (a software bus connecting software units) that interconnects the software modules that model hardware components with the software modules that model software. (See, for example, Specification, page 4, lines 5-13). According to an aspect of Applicant’s invention, this software unit, called the bus, is used for counting traffic to evaluate the overall design. (specification, page 4, lines 5-13.). Particularly, the method of the present invention is used to evaluate the proper software and hardware separation of the design to produce optimal separation between the hardware and software elements. The optimization will vary, for example, with respect to the aims of each hardware/software architecture designer according to various design factors (i.e. hardware expertise, software expertise, budget, speed of hardware design, etc.).

Tammemaie is directed to a toolkit for the co-synthesis and prototyping of re-configurable and dedicated hardware. Tammemaie teaches including data transfer profiling, such that for each variable access by the hardware element, a call to a counter function is made, and thereby each variable access is kept track of and counted. Importantly, Tammemaie does not disclose or

suggest a software bus between the hardware and software elements of the simulation to exchange data traffic as required by claim 11. Since Tammemae does not disclose the software bus, Tammemae additionally fails to disclose counting the data traffic on the bus.

Since the cited reference does not disclose each and every limitation recited in the amended claims, Applicants submit that independent claim 11 is allowable over the cited reference. Early notice to that effect is earnestly solicited. Claims 12-15 and 17-19, by their dependency on independent claim 11, are similarly allowable.

## **VI. Claim Rejections – 35 U.S.C. §103**

The Examiner has rejected claim 16 under 35 U.S.C. §103(a) as being unpatentable over Tammemae in view of U.S. Patent No. 5,604,895 to Raimi et al. and Adams et al. (“Execution Time Profiling for Multiple Process Behavioral Synthesis”).

Claim 16 is dependent from claim 11 and includes the feature of a software bus and evaluation of data traffic on the bus. As discussed above, Tammemae does not disclose, let alone teach or suggest, a software bus between the hardware and software elements of the simulation to exchange data traffic as required by claim 11. Tammemae additionally does not disclose or suggest counting the data traffic on the bus.

Neither Raimi nor Adams overcome the shortcomings of the Tammemae reference. Raimi is directed to a test coverage method. Importantly, Raimi does not teach or suggest a software bus between the hardware and software elements of the simulation to exchange data traffic as required by claim 11. In fact, Raimi teaches that isolation between hardware and software elements are defined by “known” parameters. Similarly, Adams does not overcome the shortcomings of the Tammemae reference. Adams teaches sequential reading of lines of source

code for syntax analysis. However, Adams does not teach or suggest a software bus between the hardware and software elements of the simulation to exchange data traffic as required by claim 11.

Therefore, Applicants respectfully submit that a combination of Tammemae, Raimi and Adams does not teach or suggest every claimed feature of the invention. The prior art reference (or references) must teach or suggest all of the claim limitations. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991). Since a prima facie case of obviousness has not been set forth, Applicants respectfully submits that claim 11 is allowable over the cited references. Claim 16, by its dependency on claim 11, is similarly allowable.

## **VII. Conclusion**

For the foregoing reasons, Applicants respectfully submit that all pending claims 11-19 are now in condition for allowance. Early notice to that effect is earnestly solicited.

Respectfully submitted,



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